

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A catheter for percutaneous insertion comprising:
 - a sheath portion with a lumen extending therein,
 - an insertion member disposed slidably in the lumen of said sheath portion and provided with a distal end portion capable of protruding from a distal end portion of said sheath portion,
 - an injection needle disposed in the distal end portion of said insertion member for injecting a therapeutic composition to a target tissue, and
 - paired electrodes disposed in a distal end portion of the catheter for measuring impedance, at least one of said paired electrodes being disposed at the distal end portion of said insertion member.
2. (Original) A catheter as claimed in claim 1, wherein said paired electrodes are disposed in the distal end portion of said insertion member.
3. (Original) A catheter as claimed in claim 2, wherein at least one of said paired electrodes is separated by not less than 1 mm from a leading end of a bevel of said injection needle relative to a longitudinal direction of said insertion member.

4. (Original) A catheter as claimed in claim 2, wherein said paired electrodes exist in a plurality of sets which are positioned as separated relative to a longitudinal direction of said insertion member.

5. (Original) A catheter as claimed in claim 4, wherein at least one of the electrodes composed of said plurality of sets of paired electrodes is parted by not less than 1 mm from a leading end of a bevel of said injection needle relative to the longitudinal direction of said insertion member.

6. (Original) A catheter as claimed in claim 1, wherein one of said paired electrodes is positioned at the distal end portion of said insertion member and the other of said paired electrodes is positioned in the distal end portion of said sheath portion.

7. (Original) A catheter as claimed in claim 6, wherein said electrode positioned in the distal end portion of said insertion member is parted by not less than 1 mm from a leading end of a bevel of said injection needle relative to a longitudinal direction of said insertion member.

8. (Original) A catheter as claimed in claim 6, wherein said paired electrodes exist in a plurality of sets and electrodes disposed in the distal end portion of said insertion member are positioned as individually parted relative to a longitudinal direction of said insertion member.

9. (Original) A catheter as claimed in claim 8, wherein at least one of electrodes disposed in the distal end portion of said insertion member is separated by not less than 1 mm from a leading end of a bevel of said injection needle relative to the longitudinal direction of said insertion member.

10. (Original) A catheter as claimed in claim 1, wherein the distal end portion of said sheath portion is provided with a through-hole communicating with the lumen of said sheath portion.

11. (Original) A catheter as claimed in claim 10, wherein said through-hole is separated by not less than 1 mm from an end face of the distal end portion of said sheath portion relative to a longitudinal direction of said insertion member.

12. (Original) A catheter as claimed in claim 1, wherein said target tissue is a heart.

13. (Currently Amended) A catheter system comprising:
a catheter for percutaneous insertion including a sheath portion with a lumen extending therein, an insertion member disposed slidably in the lumen of said sheath portion and provided with a distal end portion capable of protruding from a distal end portion of said sheath portion, and an injection needle disposed in the distal end portion of said insertion member for injecting a therapeutic composition to a target tissue,

paired electrodes disposed in a distal end portion of said catheter for measuring impedance, at least one of said paired electrodes being disposed at the distal end portion of said insertion member, and

a puncture detecting device to which conductors extending from said paired electrodes are able to be connected for detecting a puncture by said injection needle based on impedance values measured by said paired electrodes.

14. (Original) A catheter system as claimed in claim 13, wherein one of said paired electrodes is positioned more toward a proximal end side of said catheter than the other of said paired electrodes.

15. (Currently Amended) A method for injecting a therapeutic composition with a catheter including a sheath portion with a lumen extending therein, an insertion member disposed slidably in the lumen of said sheath portion and provided with a distal end portion capable of protruding from a distal end portion of said sheath portion, an injection needle disposed in the distal end portion of said insertion member for injecting a therapeutic composition to a target tissue, and paired electrodes disposed in a distal end portion of the catheter for measuring impedance, at least one of said paired electrodes disposed at the distal end portion of said insertion member, said method comprising the steps of:

(a) inserting said catheter into a living body and advancing it to a neighborhood of the target tissue, and

~~(b) puncturing the target tissue with said injection needle based on impedance values measured by said paired electrodes and injecting the therapeutic composition~~

into the target tissue through said injection needle measuring impedance with said paired electrodes, moving said insertion member in a distal end direction relative to said sheath portion, and protruding said injection needle from the distal end portion of said sheath portion to puncture the target tissue, and

injecting the therapeutic composition through said injection needle into the target tissue after a change is detected in the impedance values as measured by said paired electrodes.

16. (Canceled)